

U.S. Patent Application No. 10/743,885
Response to Office Action of March 27, 2007
Page 3 of 17

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Kindly cancel claims 1-126 without prejudice to applicants' ability to pursue these or other claims in the future.

Kindly add claims 127-158 as follows:

Claim 127 (new): A prosthesis for replacement of at least part of a knee joint in a leg of a patient, the leg including a femur, a tibia and a mechanical axis, the prosthesis comprising:

(a) a femoral component adapted to fit on a distal end of the femur, the femoral component including a lateral condylar structure and a medial condylar structure, the lateral condylar structure defining a lateral condylar bearing surface and the medial condylar structure defining a medial condylar bearing surface; and

(b) an accommodation structure corresponding to a proximal end of the tibia, the accommodation structure configured to cooperate with the femoral component and comprising:

(i) a medial accommodation surface configured to cooperate with the medial condylar bearing surface; wherein the medial accommodation surface and the medial condylar bearing surface define a medial compartment; and

(ii) a lateral accommodation surface configured to cooperate with the lateral condylar bearing surface; the lateral accommodation surface comprising an anterior portion and a posterior portion; the posterior portion comprising a posteriolateral proximal surface that slopes distally as the posteriolateral proximal surface progresses in a posterior direction; wherein the lateral accommodation surface and the lateral condylar bearing surface define a lateral compartment;

U.S. Patent Application No. 10/743,885
Response to Office Action of March 27, 2007
Page 4 of 17

wherein the medial and lateral compartments are asymmetric in a frontal plane of the prosthesis when the prosthesis is installed such that a line between points at which the lateral condylar bearing surface contacts the lateral accommodation surface and at which the medial condylar bearing surface contacts the medial accommodation surface is oriented at an angle that is not orthogonal to the mechanical axis of the leg;

wherein a plurality of sagittal cross sections in the medial compartment are different in shape than a plurality of sagittal cross sections in the lateral compartment; and

wherein flexion of the prosthesis causes the lateral condylar bearing surface to migrate posteriorly on the lateral accommodation surface to cause the tibia to rotate interiorly with respect to the femur during flexion.

Claim 128 (new): The prosthesis of claim 127, wherein the posteriolateral proximal surface includes a portion that is convex.

Claim 129 (new): The prosthesis of claim 127, wherein the posteriolateral proximal surface includes a portion that is substantially flat.

Claim 130 (new): The prosthesis of claim 127, wherein the posteriolateral proximal surface includes a portion that is concave.

Claim 131 (new): The prosthesis of claim 127, wherein the medial accommodation surface is concave.

U.S. Patent Application No. 10/743,885
Response to Office Action of March 27, 2007
Page 5 of 17

Claim 132 (new): The prosthesis of claim 127, wherein the internal rotation of the tibia is at least substantially 8 degrees relative to the femur at substantially 130 degrees of flexion and greater flexion angles.

Claim 133 (new): The prosthesis of claim 127, wherein the angle is approximately 3 degrees from a line that is orthogonal to the mechanical axis of the leg.

Claim 134 (new): The prosthesis of claim 127, wherein the accommodation structure comprises a raised portion extending proximally and the femoral component comprises an anterior cam and a posterior cam, the posterior cam including a surface for cooperating with a posterior surface of the raised portion on the accommodation structure in order to assist in imparting internal rotation to the tibia relative to the femur at angles of flexion between the tibia and the femur of 50 degrees or greater.

Claim 135 (new): The prosthesis of claim 134, wherein the posterior cam has an asymmetrical shape such that a lateral portion of the posterior cam is larger than a medial portion of the posterior cam.

Claim 136 (new): The prosthesis of claim 127, further comprising a tibial component adapted to fit on the proximal end of the tibia and to support the accommodation structure.

U.S. Patent Application No. 10/743,885
Response to Office Action of March 27, 2007
Page 6 of 17

Claim 137 (new): The prosthesis of claim 127, wherein the accommodation structure is a bearing plate.

Claim 138 (new): The prosthesis of claim 127, wherein the accommodation structure is adapted to fit on the proximal end of the tibia.

Claim 139 (new): A prosthesis for replacement of at least part of a knee joint in a leg of a patient, the leg including a femur, a tibia and a mechanical axis, the prosthesis comprising:

(a) a femoral component adapted to fit on a distal end of the femur, the femoral component comprising:

(i) a lateral condylar structure and a medial condylar structure, the lateral condylar structure defining a lateral condylar bearing surface and the medial condylar structure defining a medial condylar bearing surface;

(ii) a posterior cam extending between the lateral condylar structure and the medial condylar structure; wherein the posterior cam is asymmetric such that a lateral portion of the posterior cam is larger than a medial portion of the posterior cam; and

(iii) an anterior cam; and

(b) an accommodation structure corresponding to a proximal end of the tibia, the accommodation structure configured to cooperate with the femoral component and comprising:

(i) a raised portion adapted to cooperate with the anterior and posterior cams of the femoral component;

U.S. Patent Application No. 10/743,885
Response to Office Action of March 27, 2007
Page 7 of 17

(ii) a medial accommodation surface configured to cooperate with the medial condylar bearing surface; wherein the medial accommodation surface and the medial condylar bearing surface define a medial compartment; and

(iii) a lateral accommodation surface configured to cooperate with the lateral condylar bearing surface; wherein the lateral accommodation surface and the lateral condylar bearing surface define a lateral compartment;

wherein the medial and lateral compartments are asymmetric in a frontal plane of the prosthesis when the prosthesis is installed such that a line between points at which the lateral condylar bearing surface contacts the lateral accommodation surface and at which the medial condylar bearing surface contacts the medial accommodation surface is oriented at an angle that is not orthogonal to the mechanical axis of the leg; and

wherein flexion of the prosthesis causes the lateral condylar bearing surface to migrate posteriorly on the lateral accommodation surface to cause the tibia to rotate interiorly with respect to the femur during flexion.

Claim 140 (new): The prosthesis of claim 139, wherein the lateral accommodation surface comprises a posteriolateral proximal surface that slopes distally as the posteriolateral proximal surface progresses in a posterior direction.

Claim 141 (new): The prosthesis of claim 140, wherein the posteriolateral proximal surface includes a portion that is convex.

U.S. Patent Application No. 10/743,885
Response to Office Action of March 27, 2007
Page 8 of 17

Claim 142 (new): The prosthesis of claim 140, wherein the posteriolateral proximal surface includes a portion that is substantially flat.

Claim 143 (new): The prosthesis of claim 140, wherein the posteriolateral proximal surface includes a portion that is concave.

Claim 144 (new): The prosthesis of claim 139, wherein the internal rotation of the tibia is at least substantially 8 degrees relative to the femur at substantially 130 degrees of flexion and greater flexion angles.

Claim 145 (new): The prosthesis of claim 139, wherein the angle is approximately 3 degrees from a line that is orthogonal to the mechanical axis of the leg.

Claim 146 (new): The prosthesis of claim 139, further comprising a tibial component adapted to fit on the proximal end of the tibia and to support the accommodation structure.

Claim 147 (new): The prosthesis of claim 139, wherein the accommodation structure is a bearing plate.

Claim 148 (new): The prosthesis of claim 139, wherein the accommodation structure is adapted to fit on the proximal end of the tibia.

U.S. Patent Application No. 10/743,885
Response to Office Action of March 27, 2007
Page 9 of 17

Claim 149 (new): A prosthesis for replacement of at least part of a knee joint in a leg of a patient, the leg including a femur, a tibia and a mechanical axis, the prosthesis comprising:

(a) a femoral component adapted to fit on a distal end of the femur, the femoral component comprising:

(i) a lateral condylar structure and a medial condylar structure, the lateral condylar structure defining a lateral condylar bearing surface and the medial condylar structure defining a medial condylar bearing surface;

(ii) a posterior cam extending between the lateral condylar structure and the medial condylar structure; wherein the posterior cam is asymmetric such that a lateral portion of the posterior cam is larger than a medial portion of the posterior cam; and

(iii) an anterior cam; and

(b) an accommodation structure corresponding to a proximal end of the tibia, the accommodation structure configured to cooperate with the femoral component and comprising:

(i) a medial accommodation surface configured to cooperate with the medial condylar bearing surface; wherein the medial accommodation surface and the medial condylar bearing surface define a medial compartment;

(ii) a lateral accommodation surface configured to cooperate with the lateral condylar bearing surface; the lateral accommodation surface comprising an anterior portion and a posterior portion; the posterior portion comprising a posteriolateral proximal surface that slopes distally as the posteriolateral proximal surface progresses in a posterior direction; wherein the lateral accommodation surface and the lateral condylar bearing surface define a lateral compartment; and

U.S. Patent Application No. 10/743,885
Response to Office Action of March 27, 2007
Page 10 of 17

(iii) a raised portion adapted to cooperate with the anterior and posterior cams of the femoral component;

wherein the medial and lateral compartments are asymmetric in a frontal plane of the prosthesis when the prosthesis is installed such that a line between points at which the lateral condylar bearing surface contacts the lateral accommodation surface and at which the medial condylar bearing surface contacts the medial accommodation surface is oriented at an angle that is not orthogonal to the mechanical axis of the leg;

wherein a plurality of sagittal cross sections in the medial compartment are different in shape than a plurality of sagittal cross sections in the lateral compartment; and

wherein flexion of the prosthesis causes the lateral condylar bearing surface to migrate posteriorly on the lateral accommodation surface to cause the tibia to rotate interiorly with respect to the femur during flexion.

Claim 150 (new): The prosthesis of claim 149, wherein the posteriolateral proximal surface includes a portion that is convex.

Claim 151 (new): The prosthesis of claim 149, wherein the posteriolateral proximal surface includes a portion that is substantially flat.

Claim 152 (new): The prosthesis of claim 149, wherein the posteriolateral proximal surface includes a portion that is concave.

U.S. Patent Application No. 10/743,885
Response to Office Action of March 27, 2007
Page 11 of 17

Claim 153 (new): The prosthesis of claim 149, wherein the internal rotation of the tibia is at least substantially 8 degrees relative to the femur at substantially 130 degrees of flexion and greater flexion angles.

Claim 154 (new): The prosthesis of claim 149, wherein the angle is approximately 3 degrees from a line that is orthogonal to the mechanical axis of the leg.

Claim 155 (new): The prosthesis of claim 149, further comprising a tibial component adapted to fit on the proximal end of the tibia and to support the accommodation structure.

Claim 156 (new): The prosthesis of claim 149, wherein the accommodation structure is a bearing plate.

Claim 157 (new): The prosthesis of claim 149, wherein the accommodation structure is adapted to fit on the proximal end of the tibia.

Claim 158 (new): The prosthesis of claim 149, wherein the medial accommodation surface is concave.